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FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER LLP
901 NEW YORK AVENUE, NW
WASHINGTON, DC 20001-4413

EXAMINER	
SEDIGHIAN, REZA	

ART UNIT	PAPER NUMBER
2613	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/585,066	RIPOSATI, BENEDETTO	
	Examiner	Art Unit	
	M. R. Sedighian	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 October 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *35-67* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *35,37-45,47-65 and 67* is/are rejected.

7)☒ Claim(s) *36,46 and 66* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 June 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *6/29/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

1. This communication is responsive to applicant's amendments and remarks of 10/11/06. The amendments have been entered. Claims 35-67 are now pending.

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 35, 37-45, 47-55, and 57-65 are rejected under 35 U.S.C. 102(b) as being anticipated by Martinelli Mario (WO 03/014811 A1).

Regarding claims 35 and 45, Mario teaches an optical signal polarization control method (fig. 11), comprising the steps of: feeding an optical input signal (page 25, lines 1-6) to a first polarization transformation block (page 26, lines 8-10 and VR1', fig. 11) for providing a corresponding first optical output signal (page 25, line 5); feeding the first optical output signal to a second polarization transformation block (page 26, lines 10-11 and VR2', fig. 11) for providing a corresponding second output signal (page 25, lines 5-6 and O/P, fig. 11); and providing to said blocks regulating signals variable (page 10, lines 4-8, page 25, lines 21-30, page 26, lines 4-6) within limited operating intervals and such as to permit said blocks to assume the following alternative configurations (page 24, lines 24-31, page 27, lines 19-20, page 28, lines 13-23,Two-stage configuration): at least one configuration wherein one block between the first and the second blocks assumes an active state in which said configuration performs a polarization transformation that is variable over time (page 11, lines 19-20-28, the switching of retardation of VR1), and the other block assumes an inactive state in which said configuration

carries out a polarization transformation that is substantially constant over time (page 11, line 21, when the retardation of VR2 reaches a range limit), or at least one additional configuration wherein one block between the first and the second blocks is in the active state (page 11, lines 24-25, the switching of retardation of VR1) and the other block is in a reset state in order to carry out a rewind operation (page 12, lines 1-3, 8-12, when the phase retardation of VR2 is incrementally varied) wherein at least one of the corresponding regulating signals is made to assume a value within the corresponding limited interval (page 10, lines 7-8, page 15, lines 20-31, page 16, lines 1-3, page 25, lines 24-25, Control algorithm).

Regarding claim 37, Mario teaches one of the first and second output signals has a polarization state that is variable between all the possible state of polarization (page 26, lines 8-25, page 27, lines 10-17).

Regarding claim 38, Mario teaches the steps of reaching a limit value (page 11, line 21) by at least one regulating signal of one of said blocks (page 11, line 19-21); and generating at least one regulating-reset signal (page 11, line 31, page 12, lines 2-3) for bringing one of said blocks for which the reaching of the limit value has occurred into the reset state (page 12, lines 8-9).

Regarding claim 39, Mario teaches completing the rewind operation for one of said blocks which has assumed the reset state (page 12, lines 8-9); and generating at least one regulating-deactivation signal in order to bring one of said blocks from the reset state into the inactive state (page 12, line 11-12).

Regarding claim 40, Mario teaches transforming the input signal into the second output signal by carrying out any-to-any type polarization transformations (page 27, lines 10-15, 22-25, page 28, lines 13-17).

Regarding claim 41, Mario teaches generating a feedback signal (V_1', fig. 11) starting from the second output signal (page 25, lines 18-25); and processing (CTRL', fig. 11) the feedback signal (V_1', fig. 11) and generating the regulating signals (Φ_1', Φ_2', fig. 11) to be fed to said blocks (VR1', VR2', fig. 11).

Regarding claim 42, Mario teaches a measurement step carried out on the basis of an optical feedback signal which is dependent on the second output signal, the measurement step returning the feedback signal correlated with a quantity which is associated with the optical feedback signal (page 25, lines 8-25).

Regarding claim 43, Mario teaches the quantity is an optical power associated with the optical feedback signal and comprising a generation step of the regulating signals in such a manner as to control said optical power (page 26, lines 26-28).

Regarding claim 44, Mario teaches generation steps of the dithering type regulating signals for inducing variations in the polarization transformations carried out by one of the blocks in the active state (page 26, lines 4-6).

Regarding claim 47, Mario teaches said blocks are such as to carry out polarisation transformations such that at least one out of said first and second output signals has a polarization that is variable between all the possible states of polarization (page 26, lines 8-14, page 27, lines 10-17).

Regarding claim 48, Mario teaches the control stage is such as to generate at least one regulating-reset signal for bringing one of said blocks into the reset state following the reaching, by one of the corresponding regulating signals, of a limit value of its own operating interval (page 11, lines 20-26, page 12, lines 8-12).

Regarding claim 49, Mario teaches at least one of the said first and second blocks is realized according to typology of any-to-any (page 27, lines 10-15, 22-25, page 28, lines 13-17).

Regarding claim 50, Mario teaches the first and second blocks are of the any-to-any type such that first and second blocks may accomplish any-to-any type overall polarization transformations (page 27, lines 10-15, 22-25, page 28, lines 13-17).

Regarding claim 51, Mario teaches the first and second blocks may accomplish fix-to-any type overall polarisation transformations (page 26, lines 8-11).

Regarding claim 52, Mario teaches the first and second blocks may accomplish any-to-fix type overall polarisation transformations (page 33, lines 3-5).

Regarding claim 53, Mario teaches the first and second blocks respectively comprise a first and a second plurality of optical polarization conversion elements (page 26, lines 8-11, 19-21).

Regarding claim 54, Mario teaches the first and the second pluralities comprise at least one corresponding first optical element (VR1', fig. 11) having a fixed principal birefringence axis (page 26, lines 9-10, 20) and a birefringence that is variable on the basis of a corresponding first regulating signal (page 26, lines 4-6) generated by said control stage (CTRL', fig. 11).

Regarding claim 55, Mario teaches the first optical element (VR1', fig. 11) is a fiber optic squeezer (page 26, line 5, note that retarder VR1' can function as a fiber optic squeezer).

Regarding claim 57, Mario teaches one of the first and second pluralities comprises one second optical element (VR2', fig. 11) having birefringence and having a principal birefringence axis that is variable (page 26, lines 10-11) on the basis of a corresponding second regulating signal (Φ_2', fig. 11) generated by the control stage (CTRL', fig. 11).

Regarding claim 58, Mario teaches a polarization sensitive device (fig. 11) provided with an optical input port (O/P, fig. 11) for receiving the second output signal (page 25, lines 12-14); an optical output port for making available an output signal having a polarization state that is dependent on the second output signal (page 25, lines 19-25); and an optical feedback port for making available an optical feedback signal (V_1', fig. 11) having a polarization state which is dependent on the second output signal (page 25, lines 19-24).

Regarding claim 59, Mario teaches the control stage comprises a processing unit (CTRL', fig. 11) such as to process electrical signals obtained from the optical feedback signal for generating the regulating signals (page 25, lines 19-25).

Regarding claim 60, Mario teaches a measuring device for receiving the optical feedback signal and providing an electrical feedback signal to be fed to the control stage and correlated with a quantity associated with the optical feedback signal (page 25, lines 19-25).

Regarding claim 61, Mario teaches the quantity is the power associated with the optical feedback signal and the control stage generates regulating signals in such a manner as to maximize the optical power of the emerging signal present over said optical output port (page 25, lines 27-31, page 26, lines 27-28).

Regarding claim 62, Mario teaches the measuring device comprises a photo-detector (PD1', fig. 11) for converting the optical feedback signal into a corresponding electrical signal (page 15, lines 27-28).

Regarding claim 63, Mario teaches the polarization sensitive device comprises a polarization beam splitter (BS', fig. 11) optically coupled to the optical input port and having two

outputs optically coupled to the optical output port (O/P, fig. 11) and to the optical feedback port (page 25, lines 12-21).

Regarding claim 64, Mario teaches the polarization sensitive device comprises a polarizer (BS', fig. 11) which is optically coupled to the optical input port and such as to transmit a selected part of the second output signal having preset polarization over a corresponding output (page 25, lines 12-21).

Regarding claim 65, Mario teaches a first optical coupler (PBS', fig. 11) comprising a corresponding input such as to receive said selected part (page 25, lines 19-21) and send a portion of said selected part over a first output optically coupled to the optical feedback port (page 25, lines 21-24) and a corresponding second output optically coupled to the optical output port (the optical output ports of beam splitter PBS', shown in fig. 11).

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claim 56 is rejected under 35 U.S.C. 103(a) as being unpatentable over Martinelli Mario (WO 03/014811 A1) in view of Biyikli (US Patent Application Publication No: 2003/0122063 A1).

Regarding claim 56, Mario differs from the claimed invention in that Mario does not disclose the first optical element is a liquid crystal element. Biyikli teaches the use of polarization transformation elements (110, fig. 1, 210, fig. 2) such as liquid crystal (page 4,

paragraph 0029). As it is taught by Biyikli, it would have been obvious to a person of ordinary skill in the art at the time of invention to incorporate polarization transformation elements, such as liquid crystal elements, for the polarization transformation elements of Mario to selectively rotate the state of polarization at numerous angles.

6. Claim 67 is rejected under 35 U.S.C. 103(a) as being unpatentable over Martinelli Mario (WO 03/014811 A1) in view of Colavolpe et al. (US Patent Application Publication No: 2005/0129409 A1).

Regarding claim 67, Mario teaches the polarization sensitive device (fig. 11) comprises a high birefringence fiber (the propagation fiber, fig. 11) in which the second optical output signal is propagated (page 25, lines 1-6) and a measuring device (PD1', CTRL', fig. 11) which is able to provide an electrical feedback signal representative of signal distortion of the second optical signal which is propagated within the fiber (page 25, lines 19-25). Mario differs from the claimed invention in that Mario does not specifically disclose performing compensation for polarization mode dispersion. However, it is well known to compensate for polarization mode dispersion in optical systems. For example, Colavolpe teaches an optical transmission system (10, fig. 1) with polarization mode dispersion compensation (page 1, paragraphs 0001, 0009, 0011, 0012). As it is taught by Colavolpe, it would have been obvious to a person of ordinary skill in the art at the time of invention to incorporate polarization mode dispersion compensation, for the optical signal transmission system of Mario to compensate for the accumulated dispersion.

7. Claims 36, 46, and 66 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to M. R. Sedighian whose telephone number is (571) 272-3034. The examiner can normally be reached on 9 to 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Vanderpuye can be reached on (571) 272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. R. Sedighian/
Primary Examiner, Art Unit 2613